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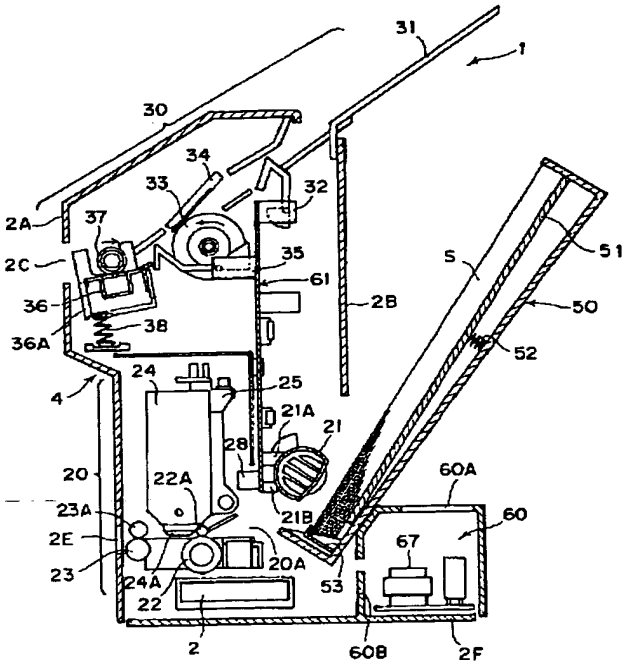
(54)【発明の名称】　ファクシミリ装置

(57)【要約】

【目的】　読取・記録にかかわる各センサ類の機能を十分に生かしつつ、センサと制御基板との間に設けられるハーネスの引きまわしを抑制することのできるインクジェット式記録装置を具えたファクシミリ装置を提供する。

【構成】　制御系を介して外部に送出する情報を搬送中の原稿から読み取る読取部３０と、読取部下方に配設され、制御系を介して供給された情報を被記録材上に出力する記録部２０と、原稿搬送路下方から被記録材搬送路上方にわたって上下方向に配設された制御用の制御基板６１，６２と、制御基板６１の送給路上部にあたる位置に配設された反射型センサ２１Ｂ，２８とを具備する。



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【特許請求の範囲】

【請求項１】　原稿の搬送路を有し、制御系を介して外部に送出するための情報を搬送中の原稿から読み取る読取部と、

送給手段から被記録材を送給する送給路とを有し、

前記読取部の下方に配置されて、前記制御系を介し外部から供給された情報または前記読取部から読み取られた情報を前記被記録材上に出力する記録部と、

前記原稿の搬送路下方から前記被記録材搬送路の上方にわたって上下方向に配設され、前記読取部および記録部の動作を制御するための手段、回路ならびに前記制御系の回路が配設された制御基板と、

該制御基板の前記被記録材送給路上部にあたる位置に配設され、該送給路に導かれた前記被記録材上の記録が検知可能な反射型センサと、を具備することを特徴とするファクシミリ装置。

【請求項２】　前記記録部は前記被記録材を前記送給路を介して記録位置に導くための搬送ローラと該搬送ローラに圧接して搬送に協働する複数の従動コロとを有し、前記反射型センサは前記被記録材の幅方向において、前記従動コロの転動軌跡から外れた位置の記録を検知することを特徴とする請求項１に記載のファクシミリ装置。

【請求項３】　前記記録部は前記送給路を介して記録位置に導かれた被記録材上にインクを吐出して記録を行うインクジェット記録ヘッドを具備するインクジェット記録式であることを特徴とする請求項１または２に記載のファクシミリ装置。

【請求項４】　前記記録ヘッドは前記記録位置に導かれた被記録材に沿って送給方向と交叉する方向の走査中にインクを吐出して記録を行い、一走査の記録ごとに前記搬送ローラおよび従動コロによって前記被記録材がシート送りされるシリアル型の記録手段であることを特徴とする請求項３に記載のファクシミリ装置。

【請求項５】　前記反射型センサは前記記録部において前記被記録材上に記録されたパターンの記録濃度を検出することにより記録のためのインクの有無を検知するインク有無検知センサであることを特徴とする請求項１ないし４のいずれかの項に記載のファクシミリ装置。

【発明の詳細な説明】

【０００１】

【産業上の利用分野】本発明はファクシミリ装置に関し、詳しくはインクジェット式記録装置を具えたファクシミリ装置に関する。

【０００２】

【従来の技術】ファクシミリ装置はそのプリンタの種類によって普通紙ファクシミリ装置と感熱ファクシミリ装置とに大別されるるが、特に最近では、保存性や環境問題、複写機と紙を共通に使用できる点などの優位性から普通紙ファクシミリ装置が普及し始めている。

【０００３】中でも廉価で得られ、またコンパクトな点でインクジェット式記録装置を搭載した普通紙ファクシミリ装置が着目されている。

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【０００４】従来のファクシミリ装置の基本的構成を図１０に示す。すなわち、従来のファクシミリ装置１００は基本的に下から電気基板部１１０、記録部１２０、原稿読取部１３０、操作部１４０の順に構成されており、電気基板部１１０には制御基板１０１、ネット制御基板１０２、主電源１０３が設けられている。さらに記録部１２０には、記録シートピックアップローラ１２１が一回転することを検出するピックアップローラセンサ１２２、記録シートの先端や後端を検出するペーパエッジセンサ１２３、記録シートに所定のパターンを記録し、その濃度を検出することによりインクの有無を検出したりジャムの判断が可能なフッタセンサ１２４等のセンサ類が設けられている。また、読取部１３０には、原稿の有無を検知する原稿有無検知センサ１３１、原稿の先端後端を検知する原稿エッジセンサ１３２等のセンサ類が設けられている。そしてこれらのセンサにはそれぞれ基板と配線束のハーネスが設けられていてハーネスを本体内を引き回すようにして、上述の制御基板１０１に結線されている。

【０００５】一方、操作部１４０のオペレーション基板１４１にはスタートキーやストップキーなどのためのタクトスイッチ１４２や表示部としてのＬＣＤ１４３などが実装されており、このようなオペレーション基板１４１が原稿搬送路より上方に配設されている為に、オペレーション基板１４１から制御基板１０１へのハーネスは原稿搬送路の幅方向および記録シート送給路の幅方向を避けて配線しなければならず、非常に長くなっている。

【０００６】さらに図１０において各部に設けられている主要部材について説明しておく。

【０００７】１２５は記録シートＳを送給するためのシートホルダ、１２６はピックアップローラ１２１により送給カセットのシートホルダ１２５から記録のために１枚ずつ送給されている記録シートＳを記録位置に搬送する搬送ローラ、１２７は記録シートＳを記録位置に保持するためのプラテンローラ、１２８Ａおよび１２８Ｂは排出ローラおよび拍車コロ、１２９は記録位置に保持される記録シートＳに対してインクを吐出し、記録を行う記録ヘッドである。

【０００８】また、１３３は原稿分離ローラ、１３４は原稿通過面上を通過する原稿上から画像を読み取る密着式イメージセンサ、１３５はイメージセンサ１３４上に原稿を密着状態に保つためのＣＳローラである。

【０００９】

【発明が解決しようとする課題】しかしながら、従来のインクジェット式記録装置を搭載したファクシミリ装置では、操作基板１４１、制御基板１０１、ネット制御基板１０２、原稿有無検知センサ用基板１３１Ａ、原稿エッジセンサ用基板１３２Ａ、ピックアップローラセンサ

用基板１２２Ａ、記録シートエッジセンサ用基板１２３Ａ、フッタセンサ用基板１２４Ａ等の多くの基板が各部に散在し、それぞれの基板間を接続する為に多くのハーネスを装置内に引き回さなければならない。特に、ファクシミリ装置１００の場合は原稿搬送路と記録シート送給路とが設けられ、これらの路とかかわる位置にはハーネスを引き回すことができないため、原稿搬送路および記録シート送給路の上下に上述の基板が存在することは、組立性を著しく悪くし、コストの上昇を招くのみらず、装置の品位を低下させ構成条件の拘束など不具合点が多かった。また、ハーネスを工夫していろいろなところに引き回すようにすると、これらのハーネスがアンテナの役目をし、放射ノイズを多量に発生し、ラジオやテレビに影響を与える。

【００１０】そのために、シールド板等の放射ノイズ対策部品をいろいろなところに配設しなければならず、かかる部品を取り付けると組立性がますます悪くなる上、品質も安定しない。

【００１１】特にインクジェット式記録装置を用いたファクシミリ装置においては、フッタセンサ１２４の存在が重要である。なぜならば、単なるインクジェット式記録装置のみの場合はオペレータがその場に居合わすことが前提であるためにインクがなくなって情報が記録されなければオペレータがすぐに気がつきインクヘッドカートリッジを交換して再度記録すればよいが、ファクシミリ装置の場合は自動受信であるためにオペレータのいないこともあり、インクがないままの状態で自動受信することは致命的欠陥である。したがって、かかるファクシミリ装置にとってインク残量検知は必須機能であり、その一手段としてフッタセンサ１２４は確実性のある有効な手段である。したがってインクジェット式記録装置を用いたファクシミリ装置１００にフッタセンサ１２４を配設する場合、その記録状態を見易くするための自然な配置として、図１０にみられるように、記録部１２０の排出側でしかも記録シートの高さのばらつきが押えられるように排出ローラ１２８近傍に配設されていた。

【００１２】しかし、このようにしてもなお問題点として次のことが挙げられる。

【００１３】①排出ローラ１２８にフッタセンサ１２４を配設すると外光の影響を受け易い。つまり、インクがまだあるにもかかわらず外光の影響によって出力が高くなりインクがなくなったと誤認識してしまうことがある。この対策のためにはフッタセンサ１２４を排出ローラ１２８から離さなくてはならないが、図１０からみても解るようにインクヘッドカートリッジ１２９と排出ローラ１２８との間にはあまり空間がない。これは装置をコンパクト化するという理由の他に、インクヘッドカートリッジ１２９から排出ローラ１２８までの紙パスを短くし排出されてくる記録シートにジャムなどが発生しないよう搬送性を高めるためである。したがって、安易にフッタセンサ１２４を排出ローラから離すためにだけカートリッジ１２９と排出ローラ１２８との間を離すわけには行かない。

【００１４】②各センサから制御基板１０１までのハーネスを、インクヘッドカートリッジ１２９の走査領域および記録シートの搬送領域から避けるようにして引き回さなければならず、そのために組立性が非常に悪くなる。

【００１５】本発明の目的は、上記従来の問題点に着目し、その解決を図るべく、フッタセンサを始め各センサ類の機能を十分に生かしつつ、しかもこれらのセンサと制御基板との間に設けられる配線のハーネスがファクシミリ装置自体の機能障害となることがないように布設されるインクジェット式記録装置を具えたファクシミリ装置を提供することにある。

【００１６】

【課題を解決するための手段】かかる目的達成するために、本発明は、原稿の搬送路を有し、制御系を介して外部に送出するための情報を搬送中の原稿から読み取る読取部と、送給手段から被記録材を送給する送給路とを有し、前記読取部の下方に配置されて、前記制御系を介し外部から供給された情報または前記読取部から読み取られた情報を前記被記録材上に出力する記録部と、前記原稿の搬送路下方から前記被記録材搬送路の上方にわたって上下方向に配設され、前記読取部および記録部の動作を制御するための手段，回路ならびに前記制御系の回路が配設された制御基板と、該制御基板の前記被記録材送給路上部にあたる位置に配設され、該送給路に導かれた前記被記録材上の記録が検知可能な反射型センサと、を具備することを特徴とするものである。

【００１７】

【作用】本発明によれば、外部に送出するための原稿を読取部において読み取り、また、外部から供給されたデータを記録部において被記録材上に記録することができるが、ここで、外部とのデータ通信にかかわる制御系および読取部、記録部の動作制御にかかわる回路を原稿搬送路の下方から被記録材送給路の上方にわたって上下方向に配設した制御基板上に纏めて配設したことから各種基板が分散配置されることなく、また、その間のハーネス引き回しが放射ノイズ発生の要因となるのを防止できる。

【００１８】また、被記録材上の記録の検知が可能な反射型センサを被記録材送給路上部にあたる制御基板上に設けたことで、反射型センサを下向きの検知姿勢に保つことをができ、外光による検出機能低下が防止される。

【００１９】

【実施例】以下に、図面に基づいて本発明の実施例を詳細かつ具体的に示す。

【００２０】図１～図３は本発明の特徴を最もよく示す構成例を示す。すなわち、本発明の特徴とするところ

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は、これらの図に示すように、読取部を記録部の上方に配設すると共に、制御基板を読取部から記録部に沿わせるようにして上下の縦方向に配設し、その制御系にかかわる検知手段を制御基板上に直接配設したことにある。

【００２１】これらの図において、１はインクジェット式記録装置を記録部２０に具えたファクシミリ装置であり、３０は原稿から画像を読み取る読取部、４０（図２，図３を参照）は最上部に配設した操作部、５０は記録部２０に記録シートＳを送給する自動送給装置（ＡＳＦ），６０は主電源部である。そこでまず、本発明にかかる読取部３０の構成について説明する。

【００２２】読取部３０において、３１は原稿送給台，３２は原稿送給台３１上の原稿の有無を検知する原稿有無検知センサ，３３は分離ローラ，３４はゴムなどで形成され分離ローラ３３に接して協働し、原稿を１枚だけ読取位置に送出するための摩擦片，３５は原稿の両端部を検知する原稿エッジセンサである。

【００２３】６１はファクシミリ装置１の筐体２内において、その前面カバー２Ａおよび後面カバー２Ｂとほぼ並列の形で上下方向に配設された制御基板であり、読み取り動作にかかわる原稿有無検知センサ３２および原稿エッジでセンサ３５は制御基板６１にそれらの基部が取付けられると共に、これらのセンサからの信号線が図示はしないが制御基板６１上に配設されている。

【００２４】３６は読み取り位置に導かれてきた原稿から画像を読み取って電気信号に変換する密着式イメージセンサ、３６Ａはイメージセンサホルダ，３７はイメージセンサ３６に原稿を圧接させた状態でその搬送にかかわると共に自体は白基準の機能を有するＣＳローラ，３８はＣＳローラ３７に向けてイメージセンサホルダ３６Ａを介し、イメージセンサ３６を偏倚させているばね，２Ｃは前面カバー２Ａに開口する原稿排出口である。

【００２５】なおここで、図１に示す分離ローラ３３およびＣＳローラ３７は内部フレーム２Ｄに支持されるモータ（以下では読取モータという。図２および図３参照のこと）３９によって駆動されるもので３９Ａおよび３９Ｂは読取モータ３９の駆動力を分離ローラ３３およびＣＳローラ３７に伝達するための伝達系ギア列である。

【００２６】続いて記録部２０およびＡＳＦ５０の構成について説明する。

【００２７】記録部２０はＡＳＦ５０からピックアップローラ２１によって１枚ずつ送給されてくる記録シートＳ上に外部からの送給信号に対応した画像を記録するもので、２２は記録シートＳの搬送およびシート送りにかかわる搬送ローラであり、その表面はゴムなどの弾性体で被装されている。

【００２８】２２Ａは搬送ローラ２２に圧接して記録シートＳの送り動作に協働する圧接コロ，２３は記録シートＳを搬送ローラ２２と共に記録位置に保持し、搬送に協働し、記録済の記録シートＳを排出口２Ｅから排出する排出ローラ，２３Ａは排出ローラ２３と協働する拍車である。２４はインクジェット式の記録ヘッドとインクタンクとが一体に形成され、キャリッジ２５に搭載されて紙面に鉛直の方向に主走査するカートリッジ式のヘッドユニット（以下で単にヘッドカートリッジと呼ぶ）であり、主走査中にインク吐出口２４Ａから記録シートＳ上に向けてインクを吐出し、記録を行う。

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【００２９】２６はヘッドカートリッジ２４のインク吐出口２４Ａからインクを強制的に吐出させる不図示の回復手段により排出されたインクを保留する廃インクタンクである。また、図２に示す２７はキャリッジ２５を移動させるキャリジモータ，２７Ａはキャリッジ２５に連結され、キャリッジモータ２７によって駆動されるタイミングベルトである。更にまた、ＡＳＦ５０も公知のもので、支持板５１上に累積された状態に保持される記録シートＳをばね５２のばね力により１枚ずつ送給可能なように分離爪５３に向けて偏倚させている。そしてその１枚がピックアップローラ２１によって送給される動作をピックアップローラセンサ２１Ａで検知していると共に送出される記録シートＳの前端および後端がペーパエッジセンサ２１Ｂによって検出される。

【００３０】２８は後述するようにして記録シートＳ上のフッタマークを検出するフッタセンサでありフッタセンサ２８は上述したピックアップローラセンサ２１Ａおよびペーパエッジセンサ２１Ｂと共に制御基板６１上にこれらの基部が固定されている。従って、ピックアップセンサ２１Ａによりピックアップローラ２１と共に回転する検知片２１Ｃを検知することでピックアップローラ２１の一回転する動作が検知される。また、ペーパエッジセンサ２１Ｂにより記録シートＳがセンサ下方の位置を通過する状態が検知され、更にまた、搬送ローラ２２および排出ローラ２３の後述する逆搬送により記録シートＳ上のフッタマークを検知し、インクの有無等を判断することができる。

【００３１】ついで、図２および図３を参照しつつ、操作部４０の構成について説明する。

【００３２】これらの図において、４１は図３に示すように横並び方向に配列された複数の操作キー，４２は操作キー４１の押下動作に応じてオン・オフされるタクトスイッチ，４３は操作キー４１の支点であり、４４は前面カバー２Ａと後面カバー２Ｂとの間に保持され、制御基板６１に電気的に接続されるＬＣＤ，４５はＬＣＤ４４の前面に設けられた透明板である。また、制御基板６１上には操作キー４１によるタクトスイッチ４２のオン・オフを表示するためのＬＥＤ４６が設けられていて、これからの光がライドガイド４７を介して前面カバー２Ａ上の点滅表示部４８に導かれ、それぞれのオン・オフが視認によって確認されるように構成されている。

【００３３】図４～図６は本発明によるファクシミリ装置１の構成を更に正面側および背面側から見て示す。こ

れらの図のうち、図４には正面側から制御基板６１と制御基板６１に並んで配設されるファクシミリ装置１に必要なネット制御のための、ネット制御基板６２まわりの構成が示されている。なお、図５はファクシミリ装置１の背面側、また、図６は背面側から主として制御基板６１およびネット制御基板６２まわりを示すもので、これらの図に示すように制御基板６１とネット制御基板６２とはコネクタ６１Ａと６２Ａとで電気的に接続される。６３は外部回線，子電話などと自在に接続の切換えが可能なモジュラージャックであり、ハーネスの数や基板の数を減らすために、好ましくは図６に示すようにネット制御基板６２に直接実装される。

【００３４】なお、ハンドセット（送受話器）６４は、一般的な使用勝手から装置１の左側に配置されるので、従い正面から見て左側にネット制御基板６２を設け、このネット制御基板６２の更に左端側にモジュラージャック６３を設けて、これにハンドセット６４を接続させるようにした。但し、図５に示すようにモジュラージャック６３を後面カバー２Ｂ上に設け、モジュラージャック６３とネット制御基板６２との間を配線によって電気的に接続するようにしてもよい。６５は外部との接続用インタフェースコネクタであり、本例のようにこれを制御基板６２上のしかも記録シートパス上方右端側に配設することでインタフェース６５からコンピュータへの配線からシート搬送の妨げとならず、機能的にも支障を来さないようにすることができる。６６は一端がヘッドカートリッジ２４に接続され、他端が制御基板６１に接続されるフレキシブルケーブルであり、フレキシブルケーブル６６を介してヘッドカートリッジ２４に原稿画像に対応した記録信号が送給される。また、２９は記録シート搬送用のモータ（以下で記録モータという）である。図５に示す２Ｆは原稿送り込み口、図６に示す２０Ａは記録シートＳがＡＳＦ５０から送給される際に通過するシート通路（送給路）である。

【００３５】また、本例では主電源部６０を図１，図２および図６に示したようにファクシミリ装置１の最下部後方に配置し、制御基板６１やネット制御基板６２から分離している。かくして、主電源部６０の上面カバーに、図１，図２に示すように換気孔６０Ａを設けて空冷効果が得られ易いようにすることができる。更にまた、主電源部６０と記録部２０との間には、底カバー２Ｆから仕切部６０Ｂを立上がらせることによって、記録部２０側からインクが主電源部６０に浸入しないようにした。なお、主電源６７と制御基板６１との間は、記録シートＳの送給路２０Ａを外した位置で図２に示すように配線ケーブル６８によって接続されるもので、記録動作にケーブル６８が支障を来すようなことがない。

【００３６】続いて、図７により本発明に係る制御用の回路構成を示す。ここで、１０はマイクロプロセッサなどで構成される中央処理装置ＣＰＵであり、ＲＯＭ３に

格納されているプログラムに従って、装置１全体を制御する。４はＲＡＭであり、ＲＡＭ４では読取部３０によって読み取られた２値化画像データおよび記録部２０によって記録される２値化画像データを格納するとともに、モデム部５によって変調され、ネット制御ユニット（ＮＣＵ）６２Ａを介して電話回線６に出力するための２値化画像データを格納する。さらに又、ＲＡＭ４には、電話回線６を介して入力されたアナログ波形信号がＮＣＵ６２Ａおよびモデム部５でデジタル値に復調された上格納される。

【００３７】７は、不揮発性ＲＡＭであり、不揮発性ＲＡＭ７には電源が遮断された状態にあっても保存されるべきデータ（例えば短縮ダイヤル番号）などが格納される。８はＪＩＳコード，アスキコード（ＡＳＣＩＩコード）などのキャラクタが格納されるキャラクタジェネレータであり、キャラクタジェネレータ８には２バイトの符号で所定のコードに対応するデータが格納されており、ＣＰＵ１０の要求に応じて自在に取り出される。

【００３８】回路３０Ａは読取部制御回路であり、回路３０ＡはＤＭＡ（ダイレクトメモリアクセス）コントローラ，画像処理ＩＣ，イメージセンサ，ＣＭＯＳロジックＩＣなどで構成され、ＣＰＵ１０の制御に基づきコンタクトセンサ（ＣＳ）を利用して読み取ったデータを２値化し、その２値化データを順次ＲＡＭ４に送出する。なお、読取部３０に対してセットされた原稿状態は、原稿の搬送路に設けられた原稿有無検知センサ３２により検出されるもので、原稿検知信号は主電源制御部９とＣＰＵ１０とに入力される。記録制御回路２０ＡはＤＭＡコントローラ，インクジェット記録装置，ＣＭＯＳロジックＩＣなどで構成され、ＣＰＵ１０の制御によってＲＡＭ４に格納されている記録データを取り出し、ハードコピーとして記録出力する。

【００３９】モデム部５は例えばＧ３，Ｇ２のモデムとこれらのモデムに接続されたクロック発生回路などで構成され、ＣＰＵ１０の制御に基づいてＲＡＭ４に格納されている送信データを変調し、ネット制御ユニット６２Ａを介して電話回線６に出力する。またモデム部５は電話回線６のアナログ信号をＮＣＵ６２Ａを介して導入し、その信号を変調して２値化データをＲＡＭ４に格納する。なお、ＮＣＵ６２ＡではＣＰＵ１０の制御に従って電話回線モデム部５または電話機６４のいずれかに切り換えて接続する。またＮＣＵ６２Ａは呼出信号（ＣＩ）を検出する手段を有し、呼出信号が検出されたときは着信信号を主電源制御部とＣＰＵ１０とに送る。なおここで電話機６４は更に詳しくはハンドセットの外にスピーチネットワーク，ダイヤル，テンキーないしワンタッチキーなどを有しているものである。

【００４０】また、操作部４０は画像送信、受信などをスタートさせるキー、送受信時におけるファイン、標準、自動受信などの操作モードを指定するモード選択キ

ーおよびダイヤリング用のテンキーないしワンタッチキーなどから構成されていて、これらのキーが押下されるとＯＮ信号が主電源制御部９およびＣＰＵ１０に入力される。また、１６桁の表示が可能な液晶表示器（図３にＬＣＤ４４および透明カバー４５として示す）には、ＣＰＵ１０の制御により所定の文字などが表示される。主電源制御部９はファクシミリ装置１全体の各部（ブロック）への通電（電力供給）を制御するもので、１チップマイクロコンピュータ，コンデンサタイプの二次電池等で構成され、この二次電池からの供給電力だけでも駆動することができる。なお、主電源制御部９では読取部制御回路３０Ａからの原稿検出信号またはＮＣＵ６２Ａからの着信信号または操作部４０からのＯＮ信号が入力されると、起動信号を主電源６０に送る。すなわち、主電源６０はＡＣ入力のスイッチング電源であり、外部からのスイッチングのＯＮ，ＯＦＦが制御可能であり主電源制御部９からの起動信号、停止信号によってそれぞれ電力を供給したり、電力を供給しなかったりする。以上の機能の中で１点鎖線で囲った部分が制御基板６１に実装されるものである。

【００４１】続いて、本発明に設けられるフッタセンサ２８の設置位置および検出動作を図８の（Ａ），（Ｂ）および図９を参照して説明する。

【００４２】ファクシミリ装置１には自動受信があるため先にも述べたように一般のプリンタとは違い、インクがなくなったことを装置が自動的に検出しなければならず、その検知手段は必須のものである。

【００４３】フッタセンサ２８はかかる検知手段として設けられるもので、図８の（Ａ）に示すように、記録が終了したあとのシート余白の所定位置にセンサ検出用パターン７１を記録する。なお、本例の場合は、５ｍｍ×５ｍｍの矩形を記録する。このパターン７１を反射型のフッタセンサ２８によって検知し、記録濃度を示す出力値によってインクの有無を判断する。つまり、インクがあるときには上述の矩形のパターン７１が記録されるためフッタセンサ２８からの出力が低くなる。一方、図８の（Ｂ）に示すように、インクが記録途中等でなくなった場合には矩形のパターン７１が記録されないためフッタセンサの２８からの出力が高くなる。従って、出力値を検出して所定値以上の出力値が得られるときにはインクがないと判断しエラーとする。

【００４４】なお、記録シートＳは前述のように搬送ローラ２２と圧接コロ２２Ａとに挟持された状態で、搬送ローラ２２と記録シートＳとの間の摩擦力により搬送されるもので、圧接コロ２２Ａは図４に示したようにコロ軸２２Ｂに支承されており、記録シートＳに接しているのは圧接コロ２２Ａの部分だけである。なお、本例の場合、圧接コロ２２Ａは記録シートの幅方向に対して、等間隔に４個並べられている。一方、搬送ローラ２２は記録モータ２９によって駆動されるもので、記録モータ２９の正転逆転することにより、搬送ローラ２２を正転逆転させるように構成されている。

【００４５】前述のように制御基板６１はヘッドカートリッジのインク吐出口２４Ａとピックアップローラ２１との間で、かつ、記録シートパス２０Ａよりも上方にあり原稿搬送路よりも下方に配設されている。そして、その制御基板６１のシートパス２０Ａに近い位置の記録シートの記録面が検出できるような位置に反射型センサであるフッタセンサ２８が設けてある。なお、フッタセンサ２８の記録シート幅方向の位置は図４に示すように圧接コロ２２Ａのない部分で、かつ最小幅記録シートＳの通過領域内に配設される。

【００４６】次に図９に従ってフッタマーク検知によるインク有無検知の基本動作について説明する。

【００４７】ステップＳ１　記録モータ２９の正回転駆動により記録シートＳを図８で矢印Ａ方向にシート送りし、通常の記録動作を行う。

【００４８】ステップＳ２　読取部３０からのデータ、もしくは電話回線６から送られてきたデータ、もしくはコンピュータから送られてきたデータに従って記録を実施する。

【００４９】ステップＳ３　記録シートＳの後端余白部分で、かつ、記録シート幅方向においてフッタセンサ２８の位置と一致する位置に５ｍｍ×５ｍｍの矩形のフッタマーク７１を記録する。（但し、インクがない場合には正常なマークが得られない。）

ステップＳ４　記録シートＳを記録モータ２９の逆転により図８で矢印Ｂ方向に所定量バックフィードし、フッタマーク７１がフッタセンサ２８の真下の位置に来るまで搬送する。

【００５０】ステップＳ５　フッタセンサ２８からの出力によってフッタマーク７１の有無を判断する。そして、フッタマーク７１が検知された場合にはステップＳ６に進むが、フッタマーク７１が正常に検知されなかった場合にはステップＳ７に進む。

【００５１】ステップＳ６　次ページがあるか否かを判断し、次ページがある場合はステップＳ１に戻る。また、次ページがない場合にはステップＳ７に進む。

【００５２】ステップＳ７　記録終了する。

【００５３】ステップＳ８　フッタマーク７１が検知されないことによりインクがないと判断し例えばエラー表示等によって警告する。

【００５４】なお、上述の実施例では制御基板６１を図２，図３等に示すように通路にかかわりのない位置で上方にまで延在させて、ここに操作部４０の操作に関わるタクトスイッチ４２やＬＥＤ４６を設けるようにしたが、制御基板６１を必ずしも原稿通路以上の高さまで延在させなくとも、タクトスイッチ４２やＬＥＤ４６を制御基板６１の上部に配置可能である。

【００５５】また、制御基板６１とネット制御基板６２

とをほぼ同一の鉛直面上で図４、図６に示すように分離したが、これらを一体に構成し、フレキシブルケーブル６６を記録部２０側に引き出すための孔をその一体基板に設けるようにしてもよい。

【００５６】

【発明の効果】以上、説明してきたように、本発明によれば、原稿の搬送路を有し、制御系を介して外部に送出するための情報を搬送中の原稿から読み取る読取部と、送給手段から被記録材を送給する送給路とを有し、前記読取部の下方に配置されて、前記制御系を介し外部から供給された情報または前記読取部から読み取られた情報を前記被記録材上に出力する記録部と、前記原稿の搬送路下方から前記被記録材搬送路の上方にわたって上下方向に配設され、前記読取部および記録部の動作を制御するための手段、回路ならびに前記制御系の回路が配設された制御基板と、該制御基板の前記被記録材送給路上部にあたる位置に配設され、該送給路に導かれた前記被記録材上の記録が検知可能な反射型センサと、を具備するので以下の効果が得られる。

【００５７】①各部の基板、および基板にかかわるハーネスを極力減らすことができ、組立性が大幅に改善される。

【００５８】②基板、ハーネスを減らすことによりその間のコネクタ接続部が少なくて済み、電気的接続部の信頼性が大幅に向上する。

【００５９】③放射ノイズの発生原因となるハーネスの引きまわしが少なくなることにより、放射ノイズが減少する。

【００６０】④記録シートの送給を含む搬送路より下方に基板が配設されないため、基板にインクが付着しないようにするためのシールド対策の必要がなく、コスト、組立性が大幅に改善される。

【００６１】⑤反射型センサを外光に関係しない位置に配置することができるので感度が上げられ、反射型センサをインクの有無検知センサとして用いることにより、インクジェット記録方式の記録部を具えたファクシミリ装置に欠かすことのできないインク残量の確実な識別ができる。

【図面の簡単な説明】

【図１】本発明による構成の一例を読取部および記録部の双方にかかわる位置で示す断面図である。

【図２】図１に示す構成を読取部の駆動手段および記録部の駆動手段にかかわる位置で示す断面図である。

【図３】本発明による構成を一部破砕して示す斜視図である。

【図４】本発明による構成を前面カバーを取り外した状態で示す正面図である。

【図５】本発明によるファクシミリ装置の背面図である。

【図６】本発明による構成を後面カバーを取り外した状態で示す背面図である。

【図７】本発明による制御用の回路構成を示すブロック図である。

【図８】本発明にかかわるフッタセンサのフッタマーク検知動作を（Ａ）および（Ｂ）の２つの状態で示す説明図である。

【図９】本発明に関わるフッタセンサによる検知動作の手順を示すフローチャートである。

【図１０】従来例のファクシミリ装置の構成例を示す断面図である。

【符号の説明】

１　ファクシミリ装置
２　筐体
２Ａ　前面カバー
２Ｂ　後面カバー
２Ｃ　原稿排出口
２Ｄ　内部フレーム
２Ｆ　原稿送り込み口
３　ＲＯＭ
４　ＲＡＭ
５　モデム部
６　電話回線
９　主電源制御部
１０　ＣＰＵ
２０　記録部
２０Ａ　シートパス
２１　ピックアップローラ
２１Ａ　ピックアップローラセンサ
２１Ｂ　ペーパエッジセンサ
２２　搬送ローラ
２３　排出ローラ
２４　ヘッドカートリッジ
２５　キャリッジ
２８　フッタセンサ
３０　読取部
３２　原稿有無検知センサ
３５　原稿エッジセンサ
３６　イメージセンサ
３７　ＣＳローラ
４０　操作部
４１　操作キー
４２　タクトスイッチ
４４　ＬＣＤ
４６　ＬＥＤ
４７　ライトガイド
４８　点滅表示部
５０　自動送給装置（ＡＳＦ）
６０　主電源部
６１　制御基板
６２　ネット制御基板

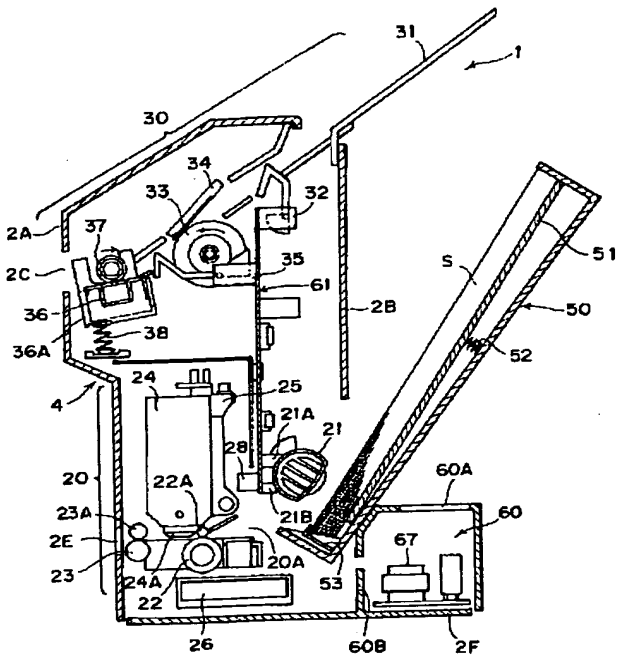
13

６３　モジュラージャック
６４　ハンドセット
６５　インタフェースコネクタ

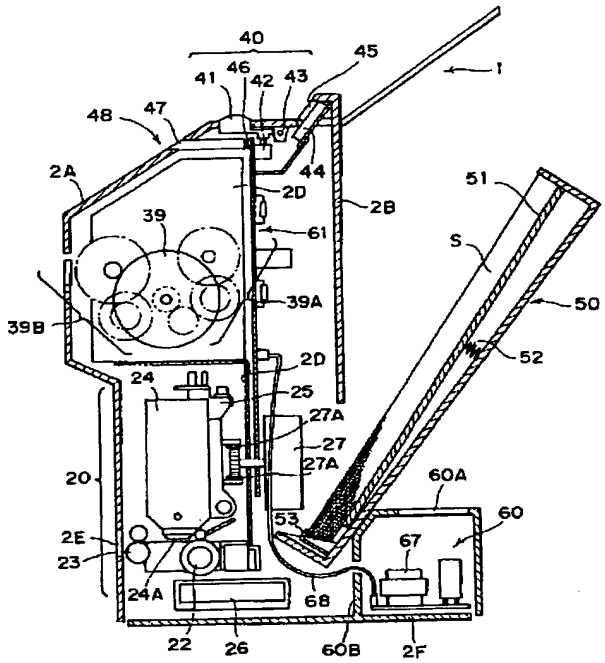
14

６６　フレキシブルケーブル
６７　主電源
７１　パターン

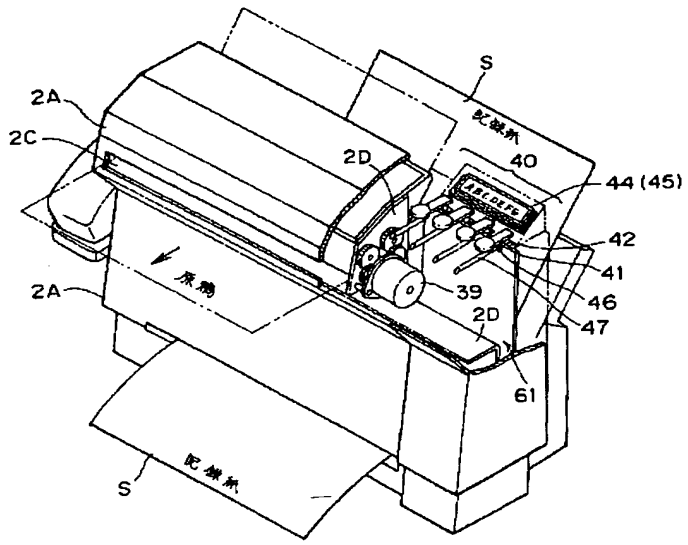
【図１】



【図２】



【図３】



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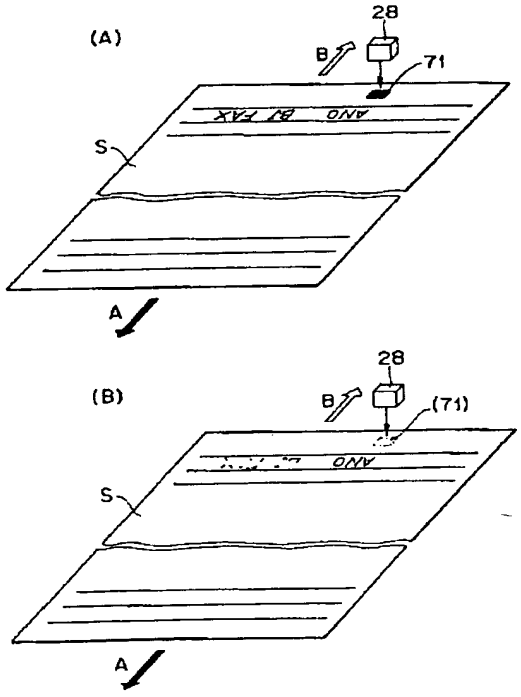

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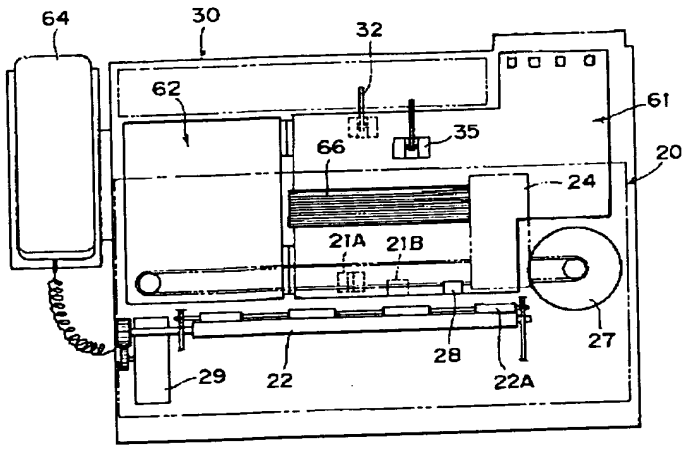
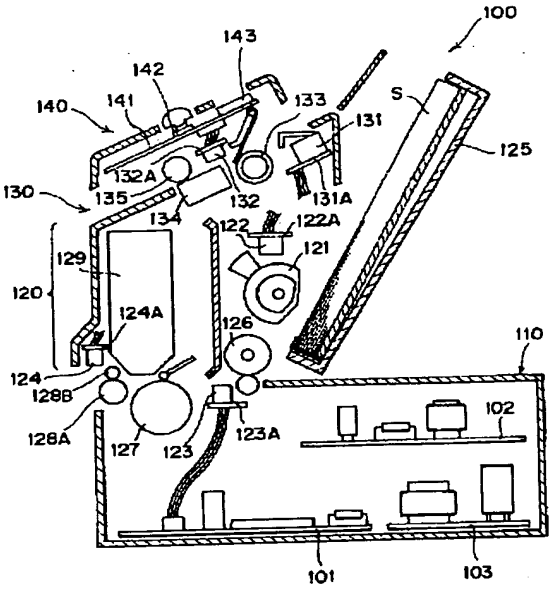
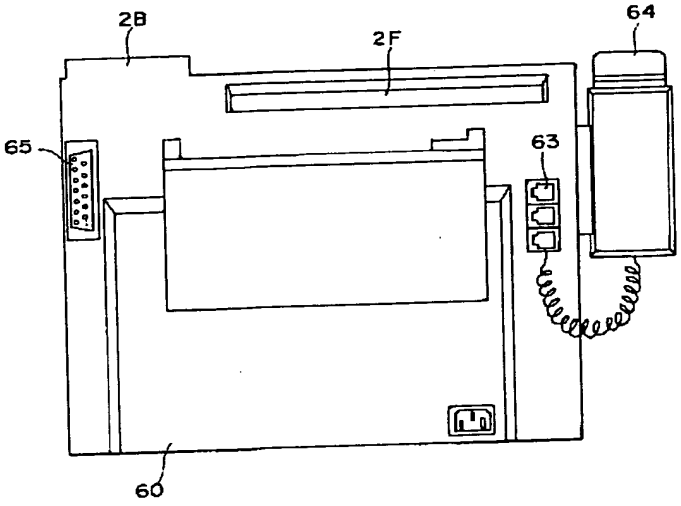

64
30
32
62
61
35
66
20
24
21A
21B
27
29
22
28
22A

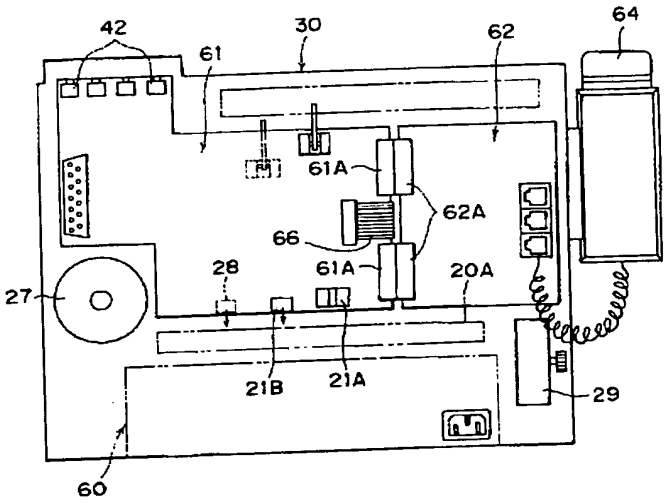
【図１０】


100
143
142
140
141
133
131
S
125
132A
130
135
132
131A
134
122
122A
121
129
120
124A
126
110
124
128B
128A
127
123
123A
102
101
103

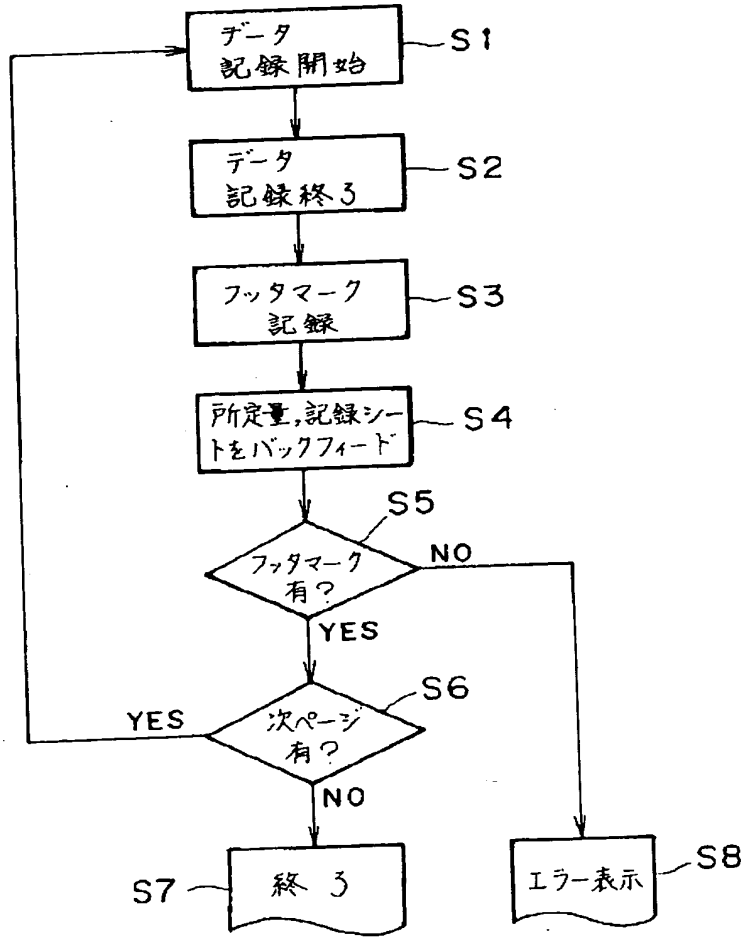
【図５】


2B
2F
64
65
63
60

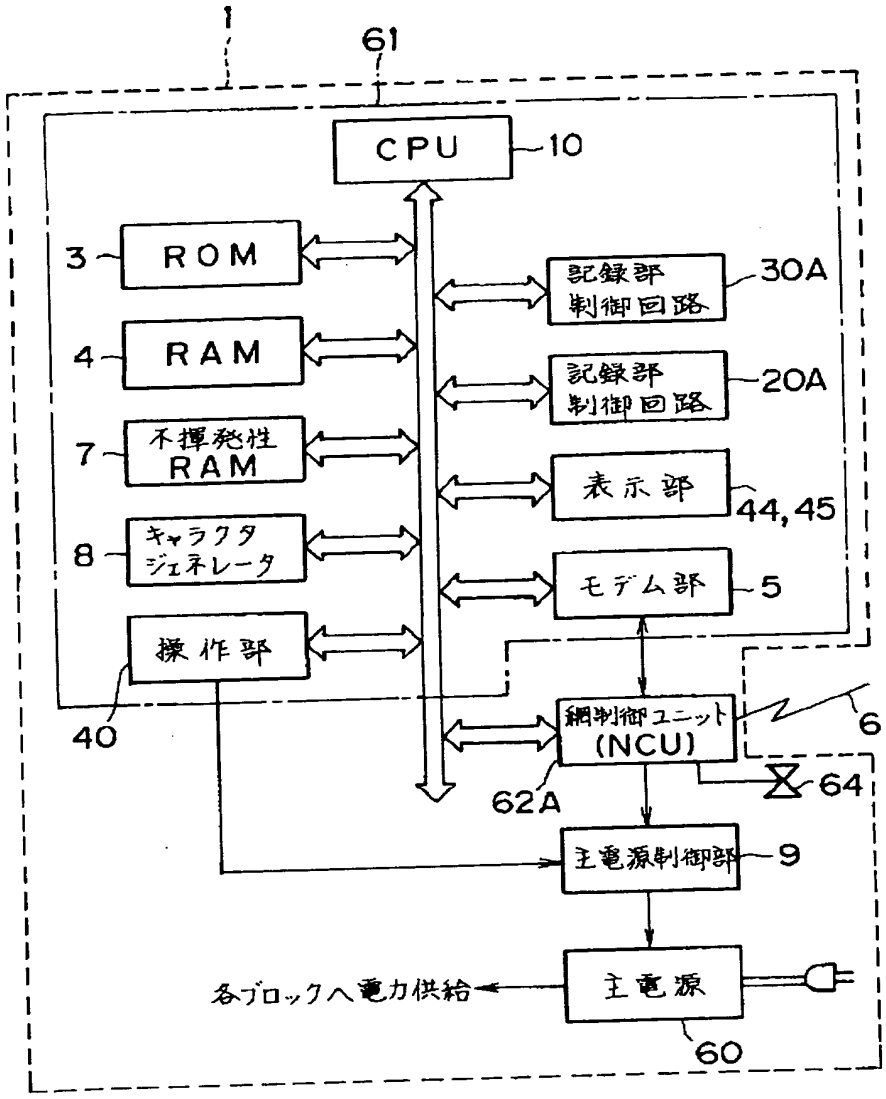
【図６】


42
30
62
64
61
61A
62A
66
28
61A
20A
27
21B
21A
29
60

【図９】


データ記録開始
S1
データ記録終了
S2
フッタマーク記録
S3
所定量，記録シートをバックフィード
S4
S5
フッタマーク有？
NO
YES
S6
次ページ有？
YES
NO
S7
終了
エラー表示
S8

【図７】



フロントページの続き

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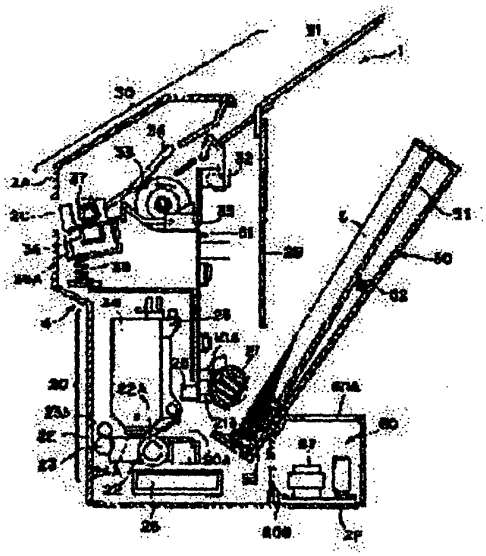
NAKANO HIROTSUGU
IWATA NAOHIRO
TERAJIMA HIDEYUKI

(54) FACSIMILE EQUIPMENT

(57)Abstract:
PURPOSE: To provide the facsimile equipment having an ink jet recorder in which wiring of a harness provided between a sensor and a control board is suppressed while sufficiently utilizing a function of each sensor relating to reading/recording.
CONSTITUTION: The facsimile equipment is provided with a read section 30 reading information sent externally via a control system from an original being carried, a recording section 20 provided under a read section and providing an output of the information fed via the control system onto a recorded medium, a control board for control arranged vertically from a lower part of an original carrier path to an upper part of the recorded material carrying path, and reflection sensors 21B, 28 arranged at a position above the supply path of the control board 61.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

* NOTICES *

1. This document has been translated by computer.So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] Facsimile apparatus characterized by providing the following. The read station read in a manuscript while conveying the information for having the conveyance way of a manuscript and sending out outside through a control system. The Records Department which outputs the information read in the information or the aforementioned read station which has the feeding way which feeds a recorded material from a feeding means, has been arranged under the aforementioned read station, and was supplied from the outside through the aforementioned control system on the aforementioned recorded material. The control board by which it was arranged in the vertical direction over the upper part of the aforementioned recorded material conveyance way from the conveyance way lower part of the aforementioned manuscript, and the circuit of the aforementioned control system was arranged in the means for controlling operation of the aforementioned read station and the Records Department, and the circuit row. The reflected type sensor which can detect the record on the aforementioned recorded material which was arranged in the position equivalent to the aforementioned section of this control board recorded material feeding on the street, and was led to this feeding way.
[Claim 2] It is the facsimile apparatus according to claim 1 the aforementioned Records Department has two or more follower KORO which carries out a pressure welding to the conveyance roller and this conveyance roller for leading the aforementioned recorded material to a record position through the aforementioned feeding way, and collaborates in conveyance, and carry out that the aforementioned reflected type sensor detects record of the position from which it separated from the rolling locus of aforementioned follower KORO in the cross direction of the aforementioned recorded material as the feature.
[Claim 3] The aforementioned Records Department is facsimile apparatus according to claim 1 or 2 characterized by being an ink-jet record formula possessing the ink-jet recording head which records by breathing out ink on the recorded material led to the record position through the aforementioned feeding way.
[Claim 4] The aforementioned recording head is facsimile apparatus according to claim 3 characterized by being a serial type record means by which record by breathing out ink and sheet delivery of the aforementioned recorded material is carried out by the aforementioned conveyance roller and follower KORO for every record of 1 scan during the scan of the feeding direction and the crossing direction along with the recorded material led to the aforementioned record position.
[Claim 5] The aforementioned reflected type sensor is facsimile apparatus given in the claim 1 characterized by being the ink existence detection sensor which detects the existence of the ink for record, or one term of 4 by detecting the record concentration of the pattern recorded on the aforementioned recorded material at the aforementioned Records Department.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] this invention relates to facsimile apparatus equipped with the ink-jet formula recording device in detail about facsimile apparatus.
[0002]
[Description of the Prior Art] Regular paper facsimile apparatus is beginning to spread from predominance, such as a point that ** by which facsimile apparatus is divided roughly into regular paper facsimile apparatus and sensible-heat facsimile apparatus according to the kind of the printer can especially use shelf life, an environmental problem, a copying machine, and paper in common recently.
[0003] Its attention is paid to the regular paper facsimile apparatus which was cheap especially, and was obtained and carried the ink-jet formula recording device at the compact point.
[0004] The fundamental composition of the conventional facsimile apparatus is shown in drawing 10 . That is, the conventional facsimile apparatus 100 is fundamentally constituted in order of the lower shell electrical-and-electric-equipment substrate section 110, the Records Department 120, the manuscript read station 130, and the control unit 140, and the control board 101, the network control board 102, and the main power supply 103 are formed in the electric substrate section 110. Furthermore, a predetermined pattern is recorded on the pickup roller sensor 122 which detects that the record sheet pickup roller 121 makes one revolution, the paper edge sensor 123 which detects the nose of cam and the back end of a record sheet, and a record sheet, by detecting the concentration, the existence of ink is detected in the Records Department 120, or the sensors of the footer sensor 124 grade which can judge a jam are prepared for it. Moreover, the sensors of the manuscript edge-sensor 132 grade which detects the nose-of-cam back end of the manuscript existence detection sensor 131 and a manuscript which detects the existence of a manuscript are formed in the read station 130. And the harness of a substrate and a wiring bunch is prepared in these sensors, respectively, and as the inside of a main part is taken about, the above-mentioned control board 101 connects the harness.
[0005] On the other hand, since the baton switch 142 for a start key, a stop key, etc., LCD143 as a display, etc. are mounted in the operation substrate 141 of a control unit 140 and such an operation substrate 141 is arranged more nearly up than a manuscript conveyance way, the harness from the operation substrate 141 to a control board 101 must avoid the cross direction of a manuscript conveyance way, and the cross direction of a record sheet feeding way, must wire, and is very long.
[0006] The primary member furthermore prepared in each part in drawing 10 is explained.
[0007] It is the recording head which records by breathing out ink to record-sheet S by which the platen roller for the sheet electrode holder for 125 feeding record sheet S, the conveyance roller which conveys record-sheet S into which one 126 is fed at a time from the sheet electrode holder 125 of a feeding cassette with the pickup roller 121 for record in a record position, and 127 holding record-sheet S in a record position, and 128A and 128B are held at an eccrisis roller and the spur koro, and 129 is held in a record position.
[0008] Moreover, the adhesion formula image sensors which read a picture in on the manuscript with

which 133 passes a manuscript separation roller and 134 passes through a manuscript passage side top, and 135 are CS rollers for maintaining a manuscript at an adhesion state on image sensors 134.
[0009]
[Problem(s) to be Solved by the Invention] However, in the facsimile apparatus which carried the conventional ink-jet formula recording device, in order that many substrates, such as the operation substrate 141, a control board 101, the network control board 102, substrate 131for manuscript existence detection sensors A, substrate 132for manuscript edge sensors A, substrate 122for pickup roller sensors A, substrate 123for record sheet edge sensors A, and substrate 124for footer sensors A, may be scattered to each part and may connect between each substrate, you have to take about many harnesses in equipment. Since a manuscript conveyance way and a record sheet feeding way were prepared and a harness was not able to be taken about in these ways or changing positions, especially in the case of facsimile apparatus 100, assembly nature was worsened remarkable, it reduced the grace of the chisel ** and the equipment which cause elevation of cost, and that an above-mentioned substrate exists in the upper and lower sides of a manuscript conveyance way and a record sheet feeding way had many fault points, such as a restraint of composition conditions. Moreover, if a harness is devised and it is made to take about at various places, these harnesses will carry out the duty of an antenna, and will generate a radiated noise so much, and radio and television will be affected.
[0010] Therefore, radiated-noise cure parts, such as a shield board, must be arranged in various places, and quality is not stabilized, either, when assembly nature will become still worse, if this part is attached.
[0011] In the facsimile apparatus especially using the ink-jet formula recording device, existence of the footer sensor 124 is important. Because, although a noticing ink head cartlidge is exchanged immediately only in the case of a mere ink-jet formula recording device and an operator should just record it again if ink is lost and information is not recorded since it is a premise that an operator is on that occasion, since it is auto-receipt in the case of facsimile apparatus and there is no operator, it is a critical defect to carry out auto-receipt in the state [that there is no ink freely]. Therefore, ink residue detection is an indispensable function for this facsimile apparatus, and the footer sensor 124 is an effective means with certainty as the way stage. Therefore, as natural arrangement for making the record state legible, it is the eccrisis side of the Records Department 120, and when the footer sensor 124 was arranged in the facsimile apparatus 100 using the ink-jet formula recording device, it was arranged by about 128 eccrisis roller so that dispersion in the height of a record sheet might moreover be pressed down so that drawing 10 might see.
[0012] However, even if it does in this way, in addition, the following thing is mentioned as a trouble.
[0013] ** If the footer sensor 124 is arranged in the eccrisis roller 128, it will be easy to be influenced of outdoor daylight. That is, although there is still ink, it may be incorrect-recognized as the output having become high and ink having been lost under the influence of outdoor daylight. Although the footer sensor 124 must be separated from the eccrisis roller 128 for this cure, there is no space between the ink head cartlidge 129 and the eccrisis roller 128 not much so that it may understand in view of drawing 10 . This is for raising conveyance nature so that a jam etc. may not be generated in the record sheet discharged by shortening the paper path from the ink head cartlidge 129 to the eccrisis roller 128 other than the reason for miniaturizing equipment. Therefore, only in order to separate the footer sensor 124 from an eccrisis roller easily, between a cartridge 129 and the eccrisis rollers 128 cannot be detached.
[0014] ** From the scanning field of the ink head cartlidge 129, and the conveyance field of a record sheet, as the harness from each sensor to a control board 101 is avoided, it must be taken about, and for the reason, assembly nature becomes very bad.
[0015] It is [to aim at the solution paying attention to the above-mentioned conventional trouble] to offer facsimile apparatus equipped with the ink-jet formula recording device laid so that the functional disorder and bird clapper of the facsimile apparatus itself may not have the harness of the wiring moreover formed among these sensors and control boards, the purpose of this invention beginning a footer sensor and fully employing the function of each sensors efficiently.
[0016]

[Means for Solving the Problem] The read station read in a manuscript while conveying the information for this invention having the conveyance way of a manuscript and sending out outside through a control system in order [this] to carry out the purpose achievement, With the Records Department which outputs the information read in the information or the aforementioned read station which has the feeding way which feeds a recorded material from a feeding means, has been arranged under the aforementioned read station, and was supplied from the outside through the aforementioned control system on the aforementioned recorded material The control board by which it was arranged in the vertical direction over the upper part of the aforementioned recorded material conveyance way from the conveyance way lower part of the aforementioned manuscript, and the circuit of the aforementioned control system was arranged in the means for controlling operation of the aforementioned read station and the Records Department, and the circuit row, It is arranged in the position equivalent to the aforementioned section of this control board recorded material feeding on the street, and is characterized by providing the reflected type sensor which can detect the record on the aforementioned recorded material led to this feeding way.

[0017]

[Function] Although the data which read the manuscript for sending out outside in the read station, and were supplied from the outside are recordable on a recorded material at the Records Department according to this invention Without distributing various substrates, since it arranged collectively on the control board which arranged the circuit in connection with the motion control of the control system in connection with data communication with the exterior and a read station, and the Records Department in the vertical direction over the upper part of a recorded material feeding way here from the lower part of a manuscript conveyance way again Harness leading about in the meantime can prevent becoming the factor of radiated-noise generating.

[0018] Moreover, it can ** maintaining a reflected type sensor at a downward detection posture by having formed the reflected type sensor which can detect record on a recorded material on the control board which hits the recorded material feeding on-the-street section, and the detection depression by outdoor daylight is prevented.

[0019]

[Example] Below, based on a drawing, the example of this invention is shown in detail and concretely.

[0020] Drawing 1 - drawing 3 show the example of composition which shows the feature of this invention best. That is, the place by which it is characterized [of this invention] is to have arranged [to have arranged in lengthwise / up-and-down /, as the control board was made to meet the Records Department from a read station, and] the detection means in connection with the control system directly on the control board while arranging a read station above the Records Department, as shown in these drawings.

[0021] In these drawings, 1 is the facsimile apparatus which equipped the Records Department 20 with the ink-jet formula recording device, and the read station to which 30 reads a picture in a manuscript, the control unit which arranged 40 (see drawing 2 and drawing 3) in the topmost part, the automatic feeding equipment (ASF) with which 50 feeds record sheet S into the Records Department 20, and 60 are the main-power-supply sections. Then, the composition of the read station 30 concerning this invention is explained first.

[0022] The scraper for the manuscript existence detection sensor by which 31 detects a manuscript feeding base and 32 detects the existence of the manuscript on the manuscript feeding base 31, and 33 being formed with a separation roller in a read station 30, and 34 being formed with rubber etc., collaborating in contact with the separation roller 33, and sending out only one manuscript to a reading station, and 35 are manuscript edge sensors which detect the both ends of a manuscript.

[0023] 61 is the control board arranged in the vertical direction in the case 2 of facsimile apparatus 1 in the form almost in parallel with front-cover 2A and rear-face covering 2B, and with the manuscript existence detection sensor 32 and manuscript edge in connection with reading operation, while, as for a sensor 35, those bases are attached in a control board 61, although the signal line from these sensors does not carry out illustration, it is arranged on the control board 61.

[0024] After the adhesion formula image sensors and 36A which reads a picture in the manuscript which 36 read and has been led to a position, and is changed into an electrical signal have made the image-sensors electrode holder image sensors 36 and 37 has made the pressure welding of the manuscript, while concerned with the conveyance, the CS roller with which the very thing has the function of white criteria, the spring with which 38 is deflecting image sensors 36 through image-sensors electrode-holder 36A towards the CS roller 37, and 2 C are the manuscript exhaust ports which carry out opening to front-cover

[0025] In addition, the separation roller 33 and the CS roller 37 which are shown in drawing 1 are a motor (henceforth a reading motor) supported by inner flame 2D here. drawing 2 -- and drawing 3 -refer to -- it drives by 39 and 39A and 39B are the transfer system gear trains for transmitting the driving force of the reading motor 39 to the separation roller 33 and the CS roller 37

[0026] Then, the composition of the Records Department 20 and ASF50 is explained.

[0027] The Records Department 20 records the picture corresponding to the feeding signal from the outside from ASF50 on record sheet S fed one sheet at a time with a pickup roller 21, 22 is a conveyance roller in connection with conveyance and sheet delivery of record sheet S, and the front face is put by elastic bodies, such as rubber.

[0028] The eccrisis roller which the pressure-welding koro which carries out the pressure welding of the 22A to the conveyance roller 22, and collaborates in delivery operation of record sheet S, and 23 hold record sheet S in a record position with the conveyance roller 22, collaborates in conveyance, and discharges record sheet S [finishing / record] from exhaust port 2E, and 23A are spurs which collaborate with the eccrisis roller 23. 24 is the head unit (it is only called a head cartlidge below) of the cartridge-type which the recording head and ink tank of an ink-jet formula are formed in one, are carried in carriage 25, and carries out horizontal scanning in the direction perpendicular to space, and records by breathing out ink towards a record sheet S top from ink delivery 24A during horizontal scanning.

[0029] 26 is a waste ink tank which suspends the ink discharged by recovery means by which it did not illustrate [which makes ink breathe out compulsorily from ink delivery 24A of a head cartlidge 24]. Moreover, the carriage motor to which 27 shown in drawing 2 moves carriage 25, and 27A are timing belts which connect with carriage 25 and are driven by the carriage motor 27. Furthermore, it is made to deflect towards the separation presser foot stitch tongue 53 so that it can feed at a time one record sheet S held at the state where ASF50 was also well-known and was accumulated on the support plate 51 again according to the spring force of a spring 52. And the front end and the back end of record sheet S which are sent out while one of them is detecting operation fed with a pickup roller 21 by pickup roller sensor 21A are detected by paper edge-sensor 21B.

[0030] It is the footer sensor which detects the footer mark on record sheet S as mentions 28 later, and these bases are being fixed on the control board 61 with pickup roller sensor 21A and paper edge-sensor 21B which mentioned the footer sensor 28 above. Therefore, operation which a pickup roller 21 turns by detecting piece of detection 21C which rotates with a pickup roller 21 by pickup sensor 21A is detected. Moreover, the state where record sheet S passes through the position of a sensor lower part by paper edge-sensor 21B can be detected, the footer mark on record sheet S can be detected further again by reverse conveyance which the conveyance roller 22 and the eccrisis roller 23 mention later, and the existence of ink etc. can be judged.

[0031] Subsequently, the composition of a control unit 40 is explained, referring to drawing 2 and drawing 3 .

[0032] In these drawings, as 41 is shown in drawing 3 , two or more operation keys arranged in the lining-up-side-by-side direction, the baton switch by which 42 is turned on and off according to depression operation of the operation key 41, and 43 are the supporting points of the operation key 41, and LCD which 44 is held between front-cover 2A and rear-face covering 2B, and is electrically connected to a control board 61, and 45 are the transparent boards formed in the front face of LCD44. Moreover, on the control board 61, Light Emitting Diode46 for displaying turning on and off of the baton switch 42 by the operation key 41 is formed, and a future light is led to the blink display 48 on front-cover 2A through the RAIDO guide 47, and it is constituted so that each turning on and off may be

checked by check by looking.
[0033] Drawing 4 - drawing 6 look at and show further the composition of the facsimile apparatus 1 by this invention from a transverse-plane and tooth-back side. The composition of the circumference of the network control board 62 for network control required for the facsimile apparatus 1 arranged together with a control board 61 and a control board 61 from a transverse-plane side is shown in drawing 4 among these drawings. In addition, as drawing 5 shows the tooth-back side of facsimile apparatus 1, drawing 6 mainly shows the circumference of a control board 61 and the network control board 62 from a tooth-back side and it is shown in these drawings, a control board 61 and the network control board 62 are electrically connected by Connectors 61A and 62A. Free, 63 is an external circuit, a child telephone, etc. and the modular jack of connection that can be switched, and in order to reduce the number of harnesses, and the number of substrates, as preferably shown in drawing 6 , it is directly mounted in the network control board 62.
[0034] in addition -- since a hand set (headset) 64 is arranged on the left-hand side of common use selfish shell equipment 1 -- following -- from a transverse plane -- seeing -- left-hand side -- the network control board 62 -- preparing -- this network control board 62 -- a modular jack 63 is further formed in a left end side, and it was made to connect a hand set 64 to this However, as shown in drawing 5 , a modular jack 63 is formed on rear-face covering 2B, and you may make it connect electrically between a modular jack 63 and the network control boards 62 with wiring. 65 is an interface connector for connection with the exterior, does not become the hindrance of sheet conveyance from wiring of KOMPYUTAHE from an interface 65 about this like this example by the thing on a control board 62 moreover arranged in a record sheet path upper part right end side, but can be prevented from causing trouble also functionally. An end is the flexible cable by which connects with a head cartlidge 24 and the other end is connected to a control board 61, and, as for 66, the record signal corresponding to the manuscript picture is fed into a head cartlidge 24 through the flexible cable 66. Moreover, 29 is a motor for record sheet conveyance (henceforth a record motor). 20A which shows 2F shown in drawing 5 to a manuscript sending mouth and drawing 6 is a sheet path (feeding way) through which it passes in case record sheet S is fed from ASF50.
[0035] Moreover, in this example, the main-power-supply section 60 has been arranged behind [bottom] facsimile apparatus 1, as shown in drawing 1 , drawing 2 , and drawing 6 , and it has dissociated from the control board 61 or the network control board 62. As shown in drawing 1 and drawing 2 , ventilating-hole 60A is prepared and it can be tended to acquire upper surface covering of the main-power-supply section 60 the air-cooling effect in this way. Furthermore, it was made for ink not to infiltrate into the main-power-supply section 60 from the Records Department 20 side again by making batch section 60B start from bottom covering 2F between the main-power-supply section 60 and the Records Department 20. A cable 68 seems in addition, for a distribution cable 68 not to connect, as the position which removed feeding way 20A of record sheet S shows to drawing 2 , and not to cause trouble to record operation between a main power supply 67 and a control board 61.
[0036] Then, the circuitry for control which starts this invention by drawing 7 is shown. Here, 10 is the central processing unit CPU which consists of microprocessors etc., and controls the equipment 1 whole according to the program stored in ROM3. 4 is RAM, and in RAM4, the modem section 5 becomes irregular and it stores the binary-ized image data for outputting to the telephone line 6 through network control unit (NCU) 62A while it stores the binary-ized image data recorded by the binary-ized image data and the Records Department 20 which were read by the read station 30. After the analog wave signal inputted through the telephone line 6 gets over to digital value in NCU62A and the modem section 5, it is stored in RAM4 further again.
[0037] 7 is nonvolatile RAM and the data (for example, abbreviated dialing number) which should be saved even if it is in the state where the power supply was intercepted by nonvolatile RAM 7 are stored. 8 is a character generator in which characters, such as JIS code and an ASCII code (ASCII code), are stored, and the data corresponding to a code predetermined with 2 bytes of sign are stored in the character generator 8, and it is taken out free according to the demand of CPU10.
[0038] Circuit 30A is a read station control circuit, and circuit 30A consists of a DMA (direct memory

access) controller, an image processing IC, image sensors, a CMOS logic IC, etc., makes binary the data read using the contact sensor (CS) based on control of CPU10, and sends out the binary-ized data to RAM4 one by one. In addition, the manuscript state set to the read station 30 is detected by the manuscript existence detection sensor 32 formed in the conveyance way of a manuscript, and a manuscript detection signal is inputted into the main-power-supply control section 9 and CPU10. Record control circuit 20A consists of a DMA controller, an ink-jet recording device, a CMOS logic IC, etc., takes out the record data stored in RAM4 by control of CPU10, and carries out a record output as hard copy.

[0039] The modem section 5 consists of KURO@KKU generating circuits connected to G3, and the modems and these modems of G2, modulates the transmit data stored in RAM4 based on control of CPU10, and outputs it to the telephone line 6 through network control unit 62A. Moreover, the modem section 5 introduces the analog signal of the telephone line 6 through NCU62A, modulates the signal, and stores binary-ized data in RAM4. In addition, in NCU62A, it switches and connects with either the telephone-line modem section 5 or the telephone 64 according to control of CPU10. Moreover, NCU62A has a means to detect a call signal (CI), and when a call signal is detected, it sends a terminating signal to a main-power-supply control section and CPU10. In addition, telephone 64 has the speech network, the dial, the ten key, or the one-touch key besides the hand set in more detail here.

[0040] Moreover, the control unit 40 consists of mode selection keys and ten keys for dialing, or one-touch keys etc. which specify the operation modes, such as a key which starts picture transmission, reception, etc., a fine ** standard at the time of transmission and reception, and auto-receipt, and ON signal will be inputted into the main-power-supply control section 9 and CPU10 if these keys are pushed. Moreover, a predetermined character etc. is displayed on the liquid crystal display (shown in drawing 3 as LCD44 and transparent covering 45) which can display 16 figures by control of CPU10. The main-power-supply control section 9 controls the energization (electric power supply) to each part (block) of the facsimile apparatus 1 whole, consists of 1 chip microcomputer and capacitor type rechargeable batteries etc., and can drive at least a supply voltage from this rechargeable battery. In addition, in the main-power-supply control section 9, an input of the manuscript detecting signal from read station control circuit 30A, the terminating signal from NCU62A, or ON signal from a control unit 40 sends a seizure signal to a main power supply 60. That is, it is the switching power supply of AC input, and a main power supply 60 can control ON of the switching from the outside, and OFF, and power is supplied, respectively by the seizure signal from the main-power-supply control section 9, and the stop signal, or it does not supply power. The portion enclosed with the dashed line in the above function is mounted in a control board 61.

[0041] Then, the installation position of the footer sensor 28 established in this invention and detection operation are explained with reference to (A), (B), and drawing 9 of drawing 8 .

[0042] Since there is auto-receipt in facsimile apparatus 1, as stated also in advance, it is different, equipment must detect automatically that ink was lost, and the detection means of a common printer is indispensable.

[0043] The footer sensor 28 is formed as this detection means, and as shown in (A) of drawing 8 , it records the sensor delivery-volume pattern 71 on the predetermined position of the sheet margin after record is completed. In addition, in this example, a 5mmx5mm rectangle is recorded. This pattern 71 is detected by the reflected type footer sensor 28, and the existence of ink is judged by the output value which shows record concentration. That is, since the pattern 71 of an above-mentioned rectangle is recorded when there is ink, the output from the footer sensor 28 becomes low. On the other hand, since the rectangular pattern 71 is not recorded when ink stops being in the middle of record etc. as shown in (B) of drawing 8 , the output from 28 of a footer sensor becomes high. Therefore, when an output value is detected and the output value beyond a predetermined value is obtained, it judges that there is no ink and considers as an error.

[0044] In addition, it is conveyed with the frictional force between the conveyance roller 22 and record sheet S, pressure-welding KORO 22A is supported by KORO shaft 22B as shown in drawing 4 , record sheet S is in the state pinched by the conveyance roller 22 and pressure-welding KORO 22A as

mentioned above, and only the portion of pressure-welding KORO 22A is in contact with record sheet S. In addition, in this example, pressure-welding KORO 22A is put in order by four regular intervals to the cross direction of a record sheet. On the other hand, the conveyance roller 22 is driven by the record motor 29, and by [of the record motor 29] carrying out a normal rotation inversion, it is constituted so that the normal rotation inversion of the conveyance roller 22 may be carried out.
[0045] above -- a control board 61 -- between ink delivery 24A of a head cartlidge, and pickup rollers 21 -- and it is more nearly up than record sheet path 20A, and is arranged more below than a manuscript conveyance way And the footer sensor 28 which is a reflected type sensor is formed in the position which can detect the recording surface of the record sheet of the position near sheet path 20A of the control board 61. In addition, the position of the record sheet cross direction of the footer sensor 28 is a portion without pressure-welding KORO 22A, as shown in drawing 4 , and it is arranged in the passage field of minimum width-of-face record sheet S.
[0046] Next, according to drawing 9 , basic operation of the ink existence detection by footer mark detection is explained.
[0047] Step S1 Sheet delivery of the record sheet S is carried out in the direction of arrow A by drawing 8 by the right rotation drive of the record motor 29, and the usual record operation is performed.
[0048] Step S2 It records according to the data from a read station 30, the data sent from the telephone line 6, or the data sent from the computer.
[0049] Step S3 It is the back end margin portion of record sheet S, and the footer mark 71 of a 5mmx5mm rectangle is recorded on the position of the footer sensor 28, and a position in agreement in the record sheet cross direction. (However, a normal mark is not obtained when there is no ink.)
Step S4 Specified quantity back feed of the record sheet S is carried out in the direction of arrow B by drawing 8 by the inversion of the record motor 29, and it conveys until the footer mark 71 comes to the position just under the footer sensor 28.
[0050] Step S5 The existence of the footer mark 71 is judged by the output from the footer sensor 28. And although it progresses to Step S6 when the footer mark 71 is detected, when the footer mark 71 is not detected normally, it progresses to Step S7.
[0051] Step S6 It judges whether there is degree page, and when there is the following page, it returns to Step S1. Moreover, when there is no following page, it progresses to Step S7.
[0052] Step S7 A record end is carried out.
[0053] Step S8 By not detecting the footer mark 71, it judges that there is no ink, for example, warns by the error message etc.
[0054] In addition, although a control board 61 is made to extend even up in a position without relation to a path as shown in drawing 2 , drawing 3 , etc. and the baton switch 42 and Light Emitting Diode46 in connection with operation of a control unit 40 were prepared here in the above-mentioned example, even if it does not make a control board 61 not necessarily extend to the height more than a manuscript path, the baton switch 42 and Light Emitting Diode46 can be arranged in the upper part of a control board 61.
[0055] Moreover, although the control board 61 and the network control board 62 were separated on the almost same vertical plane as shown in drawing 4 and drawing 6 , these are constituted in one and you may make it really [the] prepare the hole for pulling out the flexible cable 66 to the Records Department 20 side in a substrate.
[0056]
[Effect of the Invention] As mentioned above, the read station read in a manuscript while conveying the information for according to this invention having the conveyance way of a manuscript and sending out outside through a control system as explained, With the Records Department which outputs the information read in the information or the aforementioned read station which has the feeding way which feeds a recorded material from a feeding means, has been arranged under the aforementioned read station, and was supplied from the outside through the aforementioned control system on the aforementioned recorded material The control board by which it was arranged in the vertical direction over the upper part of the aforementioned recorded material conveyance way from the conveyance way lower part of the aforementioned manuscript, and the circuit of the aforementioned control system was

arranged in the means for controlling operation of the aforementioned read station and the Records Department, and the circuit row, It is arranged in the position equivalent to the aforementioned section of this control board recorded material feeding on the street, and since the reflected type sensor which can detect the record on the aforementioned recorded material led to this feeding way is provided, the following effects are acquired.

[0057] ** The harness in connection with the substrate of each part and a substrate can be reduced as much as possible, and assembly nature is improved sharply.

[0058] ** By reducing a substrate and a harness, there are few connector connections in the meantime, and they end, and the reliability of the electrical installation section improves sharply.

[0059] ** When leading about of the harness leading to [of a radiated noise] generating decreases, a radiated noise decreases.

[0060] ** Since a substrate is not caudad arranged from a conveyance way including feeding of a record sheet, there is no need for the cure against a shield for making it ink not adhere to a substrate, and cost and assembly nature are improved sharply.

[0061] ** Since a reflected type sensor can be arranged in the position which is not related to outdoor daylight, sensitivity is raised, and positive discernment of the ink residue it is [a residue] indispensable to facsimile apparatus equipped with the Records Department of an ink-jet recording method can be performed by using a reflected type sensor as an existence detection sensor of ink.

[Translation done.]

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PRIOR ART

[Description of the Prior Art] Regular paper facsimile apparatus is beginning to spread from predominance, such as a point that ** by which facsimile apparatus is divided roughly into regular paper facsimile apparatus and sensible-heat facsimile apparatus according to the kind of the printer can especially use shelf life, an environmental problem, a copying machine, and paper in common recently.
[0003] Its attention is paid to the regular paper facsimile apparatus which was cheap especially, and was obtained and carried the ink-jet formula recording device at the compact point.
[0004] The fundamental composition of the conventional facsimile apparatus is shown in drawing 10 . That is, the conventional facsimile apparatus 100 is fundamentally constituted in order of the lower shell electrical-and-electric-equipment substrate section 110, the Records Department 120, the manuscript read station 130, and the control unit 140, and the control board 101, the network control board 102, and the main power supply 103 are formed in the electric substrate section 110. Furthermore, a predetermined pattern is recorded on the pickup roller sensor 122 which detects that the record sheet pickup roller 121 makes one revolution, the paper edge sensor 123 which detects the nose of cam and the back end of a record sheet, and a record sheet, by detecting the concentration, the existence of ink is detected in the Records Department 120, or the sensors of the footer sensor 124 grade which can judge a jam are prepared for it. Moreover, the sensors of the manuscript edge-sensor 132 grade which detects the nose-of-cam back end of the manuscript existence detection sensor 131 and a manuscript which detects the existence of a manuscript are formed in the read station 130. And the harness of a substrate and a wiring bunch is prepared in these sensors, respectively, and as the inside of a main part is taken about, the above-mentioned control board 101 connects the harness.
[0005] On the other hand, since the baton switch 142 for a start key, a stop key, etc., LCD143 as a display, etc. are mounted in the operation substrate 141 of a control unit 140 and such an operation substrate 141 is arranged more nearly up than a manuscript conveyance way, the harness from the operation substrate 141 to a control board 101 must avoid the cross direction of a manuscript conveyance way, and the cross direction of a record sheet feeding way, must wire, and is very long.
[0006] The primary member furthermore prepared in each part in drawing 10 is explained.
[0007] It is the recording head which records by breathing out ink to record-sheet S by which the platen roller for the sheet electrode holder for 125 feeding record sheet S, the conveyance roller which conveys record-sheet S into which one 126 is fed at a time from the sheet electrode holder 125 of a feeding cassette with the pickup roller 121 for record in a record position, and 127 holding record-sheet S in a record position, and 128A and 128B are held at an eccrisis roller and the spur koro, and 129 is held in a record position.
[0008] Moreover, the adhesion formula image sensors which read a picture in on the manuscript with which 133 passes a manuscript separation roller and 134 passes through a manuscript passage side top, and 135 are CS rollers for maintaining a manuscript at an adhesion state on image sensors 134.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the cross section showing an example of the composition by this invention in the position in connection with the both sides of a read station and the Records Department.
[Drawing 2] It is the cross section showing the composition shown in drawing 1 in the position in connection with the driving means of a read station, and the driving means of the Records Department.
[Drawing 3] It is the perspective diagram crushing and showing a part of composition by this invention.
[Drawing 4] It is the front view showing the composition by this invention where a front cover is removed.
[Drawing 5] It is the rear view of the facsimile apparatus by this invention.
[Drawing 6] It is the rear view showing the composition by this invention where rear-face covering is removed.
[Drawing 7] It is the block diagram showing the circuitry for control by this invention.
[Drawing 8] It is explanatory drawing showing footer mark detection operation of the footer sensor in connection with this invention in the two state, (A) and (B).
[Drawing 9] It is the flow chart which shows the procedure of detection operation by the footer sensor in connection with this invention.
[Drawing 10] It is the cross section showing the example of composition of the facsimile apparatus of the conventional example.
[Description of Notations]
1 Facsimile Apparatus
2 Case
2A Front cover
2B Rear-face covering
2C Manuscript exhaust port
2D Inner flame
2F Manuscript sending mouth
3 ROM
4 RAM
5 Modem Section
6 Telephone Line
9 Main-Power-Supply Control Section
10 CPU
20 Records Department
20A Sheet path
21 Pickup Roller
21A Pickup roller sensor
21B Paper edge sensor
22 Conveyance Roller

23 Eccrisis Roller
24 Head Cartlidge
25 Carriage
28 Footer Sensor
30 Read Station
32 Manuscript Existence Detection Sensor
35 Manuscript Edge Sensor
36 Image Sensors
37 CS Roller
40 Control Unit
41 Operation Key
42 Baton Switch
44 LCD
46 LED
47 Light Guide
48 Blink Display
50 Automatic Feeding Equipment (ASF)
60 Main-Power-Supply Section
61 Control Board
62 Network Control Board
63 Modular Jack
64 Hand Set
65 Interface Connector
66 Flexible Cable
67 Main Power Supply
71 Pattern

[Translation done.]

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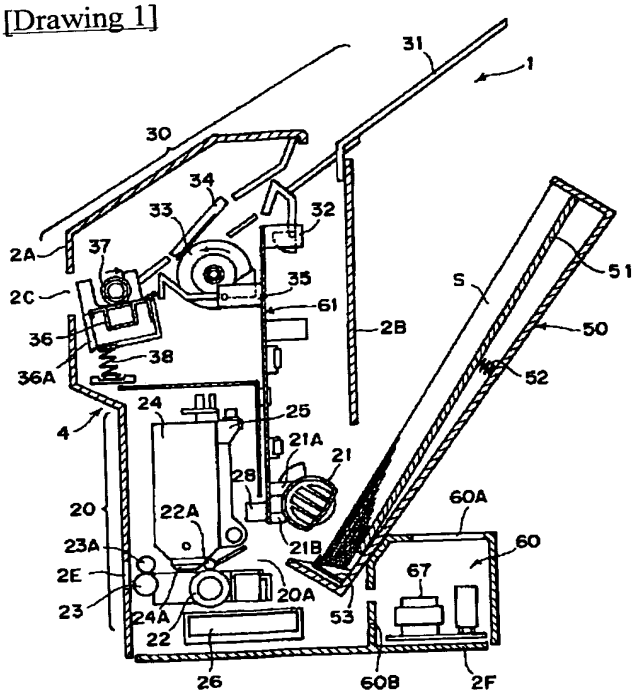
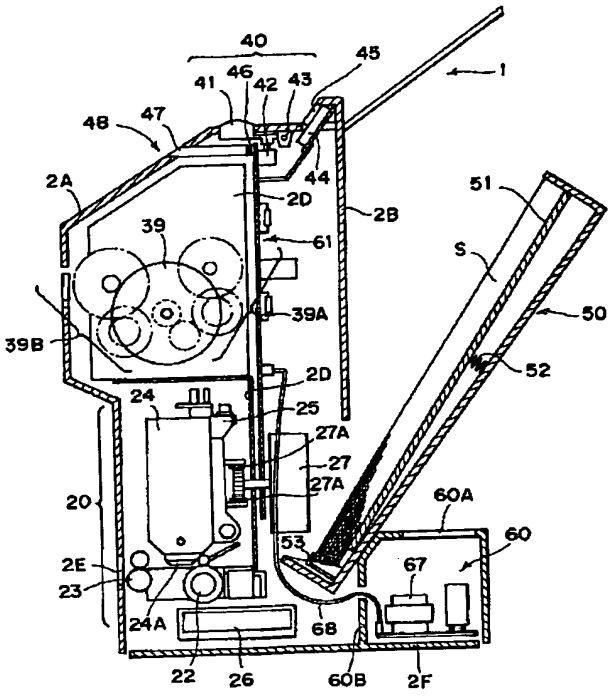
DRAWINGS

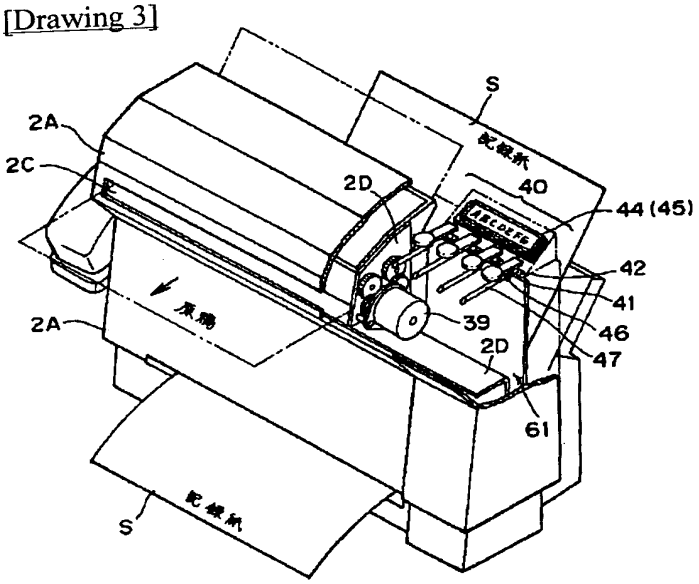
[Drawing 1]



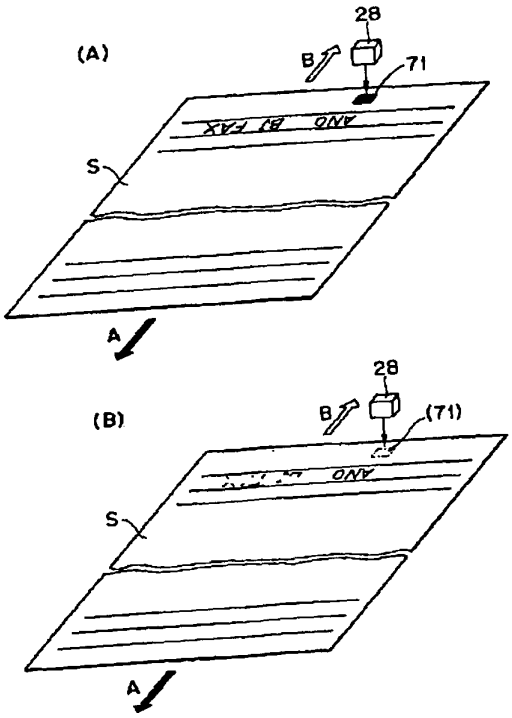
[Drawing 2]



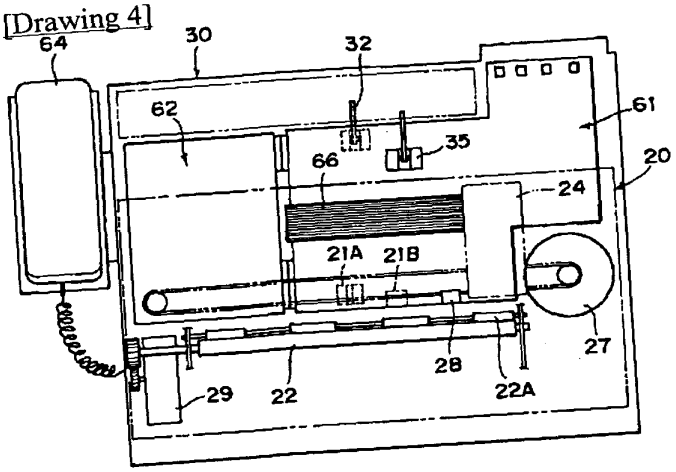
[Drawing 3]



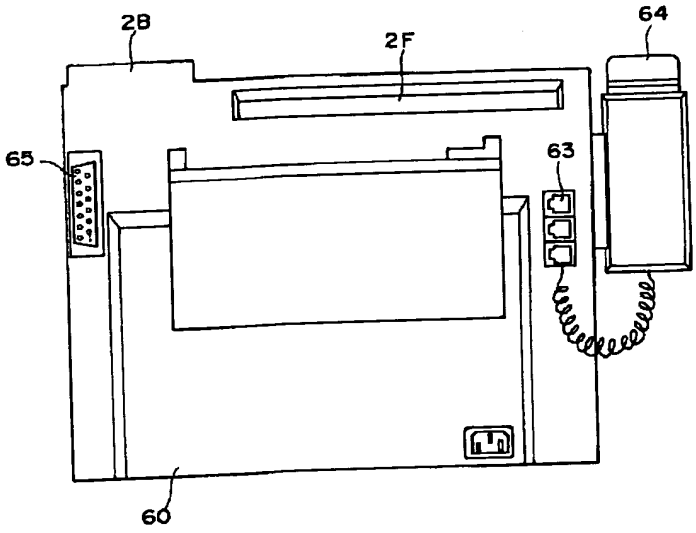
[Drawing 8]



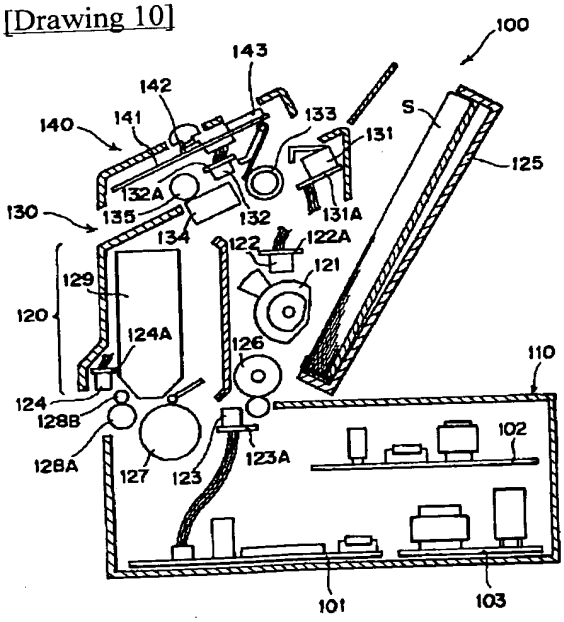
[Drawing 4]



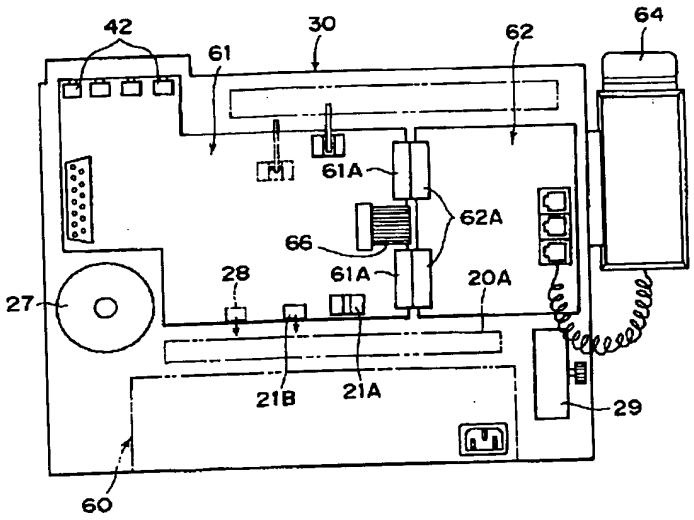
[Drawing 5]



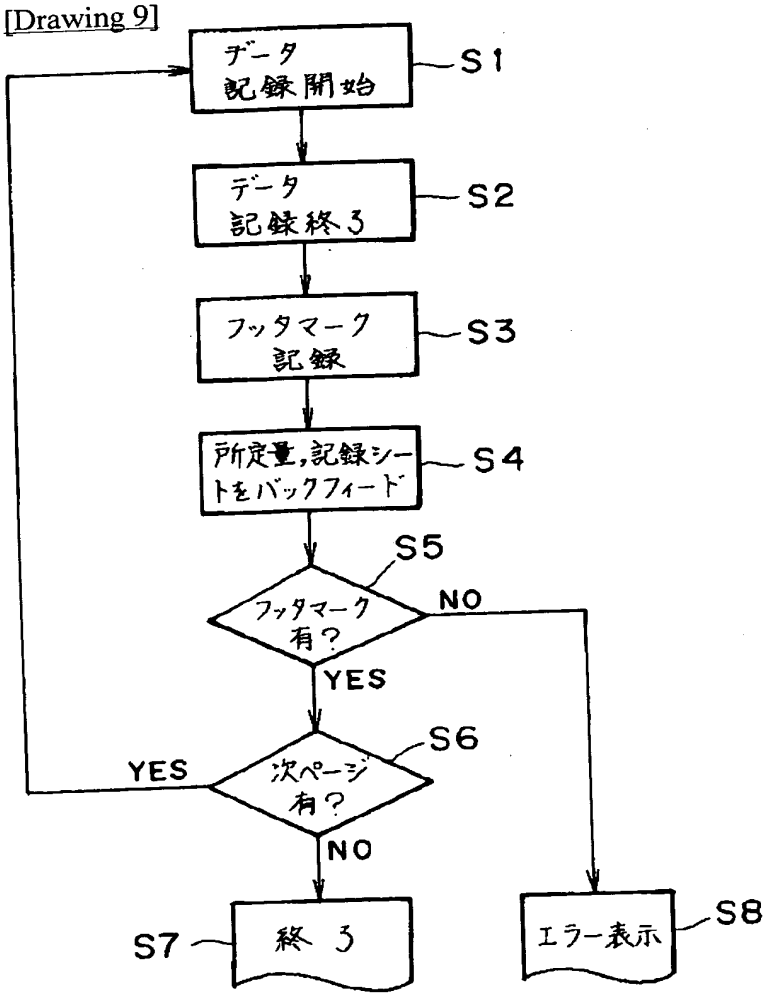
[Drawing 10]



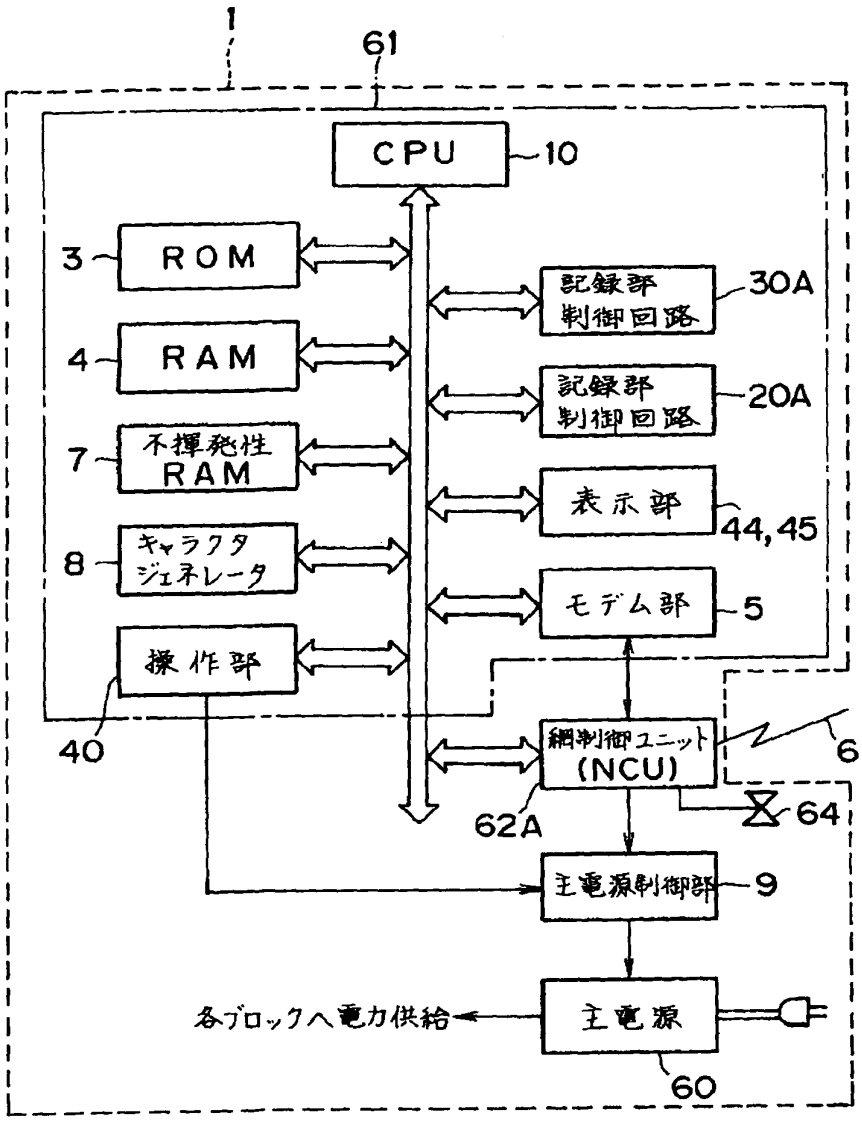
[Drawing 6]



[Drawing 9]



[Drawing 7]



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